Pertussis in Texas

Nature of Problem

Pertussis, or whooping cough, is an acute, infectious, toxin-mediated disease caused by the bacterium *Bordetella pertussis*. The bacterium attaches to ciliated epithelial cells of the respiratory tract and produces toxins that cause inflammation of tissues and a subsequent cough, which proceeds from moderate to severe spasms with vomiting often following. These attacks may last for several weeks and convalescence may last for months.

Figure 1

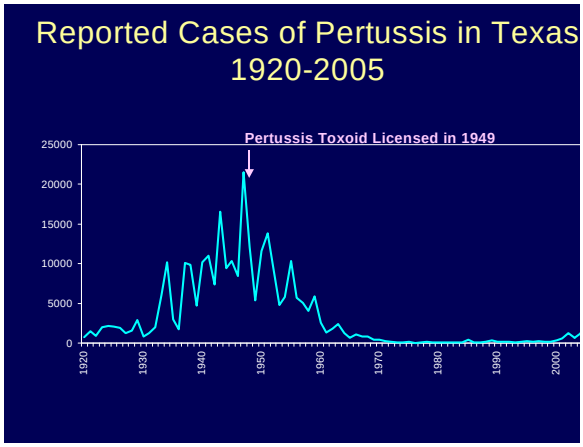
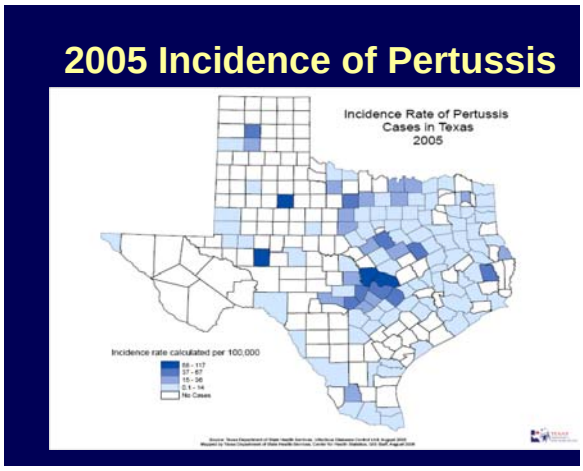


Figure 2



Prior to the introduction of the vaccine, up to 20,000 cases were reported annually in Texas, with an average of 9,000 cases reported annually between 1940 through 1959 (range: 4,020-21,558). After the introduction of the vaccine, the number of cases steadily dropped. From 1980 through 1999 the average number of cases reported dropped to 300 (range: 60-379) (Figure 1).

Though pertussis has been a vaccine-preventable disease since the 1949, it resurged in 2000 as a public health issue affecting many in Texas. Although this increase may be due in part to increased awareness and reporting, corresponding increases in the number of hospitalizations and deaths indicates that pertussis is once again a major public health problem. In 2005, over 2,000 Texas cases of pertussis were reported to the Centers for Disease Control and Prevention (CDC), including nine deaths (8 among infants). Cases of pertussis were spread throughout the state as depicted in Figure 2.

The majority of hospitalizations occur in infants less than 6 months of age. Twenty-six infant pertussis deaths have been recorded since 2000 in 21 different counties. Deaths occurred in both urban and rural counties. In some of the rural counties no cases of pertussis had been reported in 2 or more years prior to the death.

As demonstrated in the graph below, pertussis occurs in a cyclical pattern of every 3 to 4 years.

Review of the data by age group reveals that 27% of the 2005 pertussis cases occurred among infants younger than 1 year of age, and another 27% among

adults. Of those younger than 1 year of age, 21% of the cases occurred among infants 1 to 6 months of age. Adolescents (age 10 to 19 years of age) comprised 21% of the pertussis case.

Clinical Symptoms and Considerations

Pertussis should be considered when evaluating any patient with an acute cough illness characterized by one or more of the following symptoms: prolonged cough, cough with paroxysms, whoop, or post-tussive gagging/vomiting. Infants may present with apnea and/or cyanosis. An increased white blood cell count with lymphocytosis is a characteristic but nonspecific finding. Adults, teens, and vaccinated children often have mild symptoms that mimic bronchitis or asthma.

Pertussis immunity is not absolute (100%) and wanes over time (approximately 5 to 10 years after completion of childhood vaccinations). Therefore, being vaccinated may not prevent infection. Older children and adults with mild illness can transmit the infection and are often the source of illness in infants. Therefore, early recognition and treatment of pertussis in contacts of young infants and prophylaxis of their household members is especially important.

Laboratory tests should be used in conjunction with clinical symptoms for diagnosis and can be used to confirm but not rule out pertussis. The organism is more likely to be found early in the coughing phase. After 3 to 4 weeks of cough the organism may have cleared the nasopharyngeal area, although unvaccinated infants may remain culture-positive for more than six weeks. The gold standard for pertussis laboratory testing is isolation of *B. pertussis* by culture. However, the organism is difficult to isolate by culture. The preferred testing is polymerase chain reaction (PCR) testing of nasopharyngeal swabs. The PCR is rapid, sensitive, and specific. Serologic testing is not yet standardized. Because of the lack of association between antibody levels and immunity to pertussis, results of serologic testing are difficult to interpret and are not used to confirm a pertussis diagnosis. Direct fluorescent antibody (DFA) testing of nasopharyngeal specimens has low sensitivity and variable specificity. DFA should no longer be used for laboratory confirmation of pertussis.

Treatment

Antibiotic treatment of suspects and contacts is recommended. For specifics on treatment please refer to the CDC's treatment guidelines, which can be found on-line in pdf format or html format.

Treatment more than 3 weeks after cough onset has limited benefit to the patient or their contacts except for high-risk patients. Symptomatic women late in pregnancy and exposed infants should be treated within 6 weeks of onset or exposure.

Symptomatic children and/or adults may return to school or work only after completing 5 days of treatment.

If pertussis is clinically suspected:

- Report immediately to your local health authority. This will initiate an epidemiological investigation and assure that appropriate control measures are initiated in all settings.
- Begin chemoprophylaxis of patient and all household and close

Quick*Links*

IDCU Pertussis Information

IDCU Reporting Information

DSHS Laboratory Services Section

DSHS Immunization Branch

***Centers for Disease Control and Prevention* Guidelines for the Control of Pertussis Outbreaks**

contacts *regardless of age or vaccination status*.

- Submit specimens for laboratory confirmation. The preferred laboratory test for confirmation of pertussis is polymerase chain reaction (PCR) testing.
- Review immunization records for children younger than 7 years of age. Children in this age group who have not completed the DTaP 4-dose primary series should complete the series with minimal intervals. Those who have completed the primary series should be given a booster dose if their last dose of DTaP was given more than 3 years ago.
- Consider vaccinating adolescents and adults with tetanus-diphtheria-acellular pertussis (Tdap) if they are due for a Td booster.

For more information on Tdap, please refer to the following CDC recommendations:

Adolescents

- http://www.cdc.gov/mmwr/PDF/rr/rr5503.pdf (pdf format)
- http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5503a1.htm (html format)

Adults

- http://www.cdc.gov/mmwr/PDF/rr/rr5517.pdf (pdf format)
- http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5517a1.htm (html format)

Healthcare Personnel

- http://www.cdc.gov/mmwr/PDF/rr/rr5517.pdf (pdf format)
- http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5517a1.htm (html format)

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